UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/725,025	12/02/2003	Nabil Seddigh	TR-176-US	4722

36630 7590 06/01/2007

VICTORIA DONNELLY
PO BOX 24001
HAZELDEAN RPO
KANATA, ON K2M 2C3
CANADA

EXAMINER	
KIM, DAVID S	

ART UNIT	PAPER NUMBER
2613	

MAIL DATE	DELIVERY MODE
06/01/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/725,025	SEDDIGH ET AL.	
	Examiner	Art Unit	
	David S. Kim	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 March 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Applicant's response to the objections to the claims in the previous Office Action (mailed on 20 November 2006) is noted and appreciated. Applicant responded by amending the claims, which overcomes the objections.

2. **Claims 1, 16, and 22-25** are objected to because of the following informalities:

Claims 1 and 16 use the phrase "modulating a wavelength", which implies a changing wavelength. However, paragraph [0026] of the specification implies that the wavelength does not substantially change since the wavelength value is the information that identifies a light path. As a remedy, perhaps Applicant intended to use a slightly different phrase, such as "modulating an optical signal with a particular wavelength".

Claims 22-25 use the phrase "optical nodes that are provisioned with said optical signature" under the "second means" limitation. However, antecedent basis is lacking for this phrase. Applicant may have intended to correspond this phrase with the phrase "optical nodes comprising said second sequence of optical nodes" from similar claim 7 or the phrase "optical nodes that are provisioned to process said optical signature" from claims 9-10.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of

each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. **Claims 1-3, 6-12, 14-18, 21-26, and 28-29** are rejected under 35 U.S.C. 103(a) as being unpatentable over Heismann et al. ("Signal tracking and performance monitoring in multi-wavelength optical networks", hereinafter "Heismann") in view of the Admitted Prior Art (hereinafter the "APA") and Rajagopal et al. (U.S. Patent No. 7,120,118 B2, hereinafter "Rajagopal").

Regarding claim 1, Heismann discloses:

A method for monitoring a light path between a source optical node and a destination optical node (source-destination pair in Fig. 1a) in an Optical Communication Network (OCN) comprising a plurality of optical nodes where at least two nodes are interconnected (notice the plurality of interconnected nodes in Fig. 1a), the method comprising the steps of:

modulating a wavelength with an optical signature detectable in the optical domain, the optical signature defining said light path (ID Tag in Fig. 1a).

Heismann does not expressly disclose:

said at least two nodes are interconnected by optical supervisory channels,

said optical communication network having an associated control network.

However, optical supervisory channels and associated control networks are known in the art, as shown by the APA (OSC and CN in Fig. 1). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to include these features in the method of Heismann. One of ordinary skill in the art would have been motivated to do this since they are common means for providing ordinary network management.

Heismann in view of the APA does not expressly disclose:

the method comprising the steps of:

executing a first procedure for identifying a first sequence of optical nodes currently receiving said optical signature (col. 4, l. 29-43);

executing a second procedure for identifying a second sequence of optical nodes provisioned to form said light path between the source node and the destination node (block 212 in Fig. 2);

executing a third procedure based on a step of flooding of enquiry messages for identifying each optical node in said plurality of optical nodes that detects said optical signature (block 502 in Fig. 5B applies to all current paths, thus being global); and

executing a fourth procedure for identifying each optical node from among said at least two optical nodes that detects said optical signature (block 502 in Fig. 5B includes the procedure of identifying individual paths as in col. 7, l. 36-39, thus being local);

wherein said first procedure, second procedure, third procedure, and fourth procedure are initiated at a command-line interface of a selected start optical node determined to be belong to said light path (e.g., traffic management nodes (TMNs) provide monitoring step, all paths are monitored in block 200 in Fig. 2, one of these paths would include a TMN start node where the monitoring step is invoked).

However, it is known to perform similar procedures to monitor a path in a communication network, as shown by Rajagopal (e.g., multi-path analysis in col. 1, l. 7-10). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to implement further procedures in the method of Heismann, such as the procedures of Rajagopal. One of ordinary skill in the art would have been motivated to do this since Heismann is focused on a particular technique of tracking an optical signal and is relatively silent about how to incorporate this technique in the more general management of a communication network. Rajagopal speaks into this silence by providing procedures that incorporate signal/path tracking information into other management aspects of a communication network (e.g., identification of current paths in Figs. 2 and 5 to determine alternate paths).

Accordingly, Heismann in view of the APA and Rajagopal would further disclose:

the method comprising the steps of:

executing a first procedure for identifying a first sequence of optical nodes currently receiving said optical signature (identification of current paths in col. 4, l. 29-43 of Rajagopal with the optical signal tracking information in p. 3.48, first paragraph, of Heismann);

executing a second procedure for identifying a second sequence of optical nodes provisioned to form said light path between the source optical node and the destination optical node (block 212 in Fig. 2 of Rajagopal);

executing a third procedure based on a step of flooding of enquiry messages for identifying each optical node in said plurality of optical nodes that detects said optical signature (block 502 in Fig. 5B applies to all current paths; block 502 is described in col. 7, l. 34-39, and this refers to block 200 in Fig. 2; block 200 may employ flooding of messages to all other nodes as described in col. 4, l. 34-43; these teachings of Rajagopal are implemented with the optical signal tracking information in p. 3.48, first paragraph, of Heismann); and

executing a fourth procedure for identifying each optical node from among said at least two optical nodes that detects said optical signature (block 502 in Fig. 5B includes the procedure of identifying individual paths as in col. 7, l. 36-39 of Rajagopal with the optical signal tracking information in p. 3.48, first paragraph, of Heismann);

wherein said first procedure, second procedure, third procedure, and fourth procedure are initiated at a selected start optical node determined to be belong to said light path (Rajagopal, e.g., traffic management nodes (TMNs) provide monitoring step, all paths are monitored in block 200 in Fig. 2, one of these paths would include a TMN start node where the monitoring step is invoked).

Heismann in view of the APA and Rajagopal does not disclose:

wherein said first procedure, second procedure, third procedure, and fourth procedure are initiated at a ***command-line interface*** of a selected start optical node determined to be belong to said light path.

Regarding the command-line interface limitation, notice that Rajagopal's method is realized in computer hardware, firmware, software, or combinations thereof (col. 11, l. 63-67). A command line interface is an obvious limitation for Rajagopal's method since it is an extremely common way for a practitioner to interface with a computer program, which is generally realized in computer hardware, firmware, software, or combinations thereof.

Regarding claim 2, Heismann in view of the APA and Rajagopal discloses:

The method of claim 1 wherein the step of executing said first procedure comprises the step of:

constructing a current list of optical nodes comprising said first sequence of optical nodes (Rajagopal, e.g., identification of current paths in 200 in Fig. 2).

Heismann in view of the APA and Rajagopal does not expressly disclose:

displaying said list of optical nodes.

However, displaying such information is an obvious technique so that a practitioner can follow the progression of the method.

Regarding claim 3, Heismann in view of the APA and Rajagopal does not expressly disclose:

The method of claim 2, wherein the step of constructing the current list of optical nodes comprises the steps of:

constructing a first list of optical nodes that are currently traversed in sequence by the light path from said selected start optical node to the source optical node; and

constructing a second list of nodes that are currently traversed in sequence by the light path from said selected start optical node to the destination node.

However, such lists would be obvious features to add. That is, consider the common diagnostic feature of determining one's location in the network or one's location along a path. One list from the selected start optical node to the source optical node would provide one's location with respect to the source optical node. Similarly, one list from the selected start optical node to the destination optical node would provide one's location with respect to the destination optical node.

Regarding claim 6, Heismann in view of the APA and Rajagopal does not expressly discloses:

The method of claim 3 wherein the step of displaying said current list of optical nodes comprises the step of displaying said first list and said second list.

However, displaying such information is an obvious technique so that a practitioner can follow the progression of the method.

Regarding claim 7, Heismann in view of the APA and Rajagopal discloses:

The method of claim 1, wherein said second procedure comprises the steps of:

constructing a reference list of optical nodes (Rajagopal, e.g., list of nodes of detour/alternate paths in 212 of Fig. 2; these nodes will process the optical signature of Heismann for tracking).

Heismann in view of the APA and Rajagopal does not expressly disclose:

displaying said reference list of optical nodes.

However, displaying such information is an obvious technique so that a practitioner can follow the progression of the method.

Regarding claim 8, Heismann in view of the APA and Rajagopal discloses:

The method of claim 7 wherein the step of constructing said reference list of nodes comprises the steps of:

constructing a third list of optical nodes that are provisioned to be on the light path from the selected start optical node to the source optical node (Rajagopal, e.g., col. 8, l. 28-29, TMN 3 as start node and TMN 6 as source node; these nodes will process the optical signature of Heismann for tracking); and

constructing a fourth list of optical nodes that are provisioned to be present on the light path from the selected start node to the destination optical node (Rajagopal, e.g., col. 8, l. 30, TMN 3 as start node and TMN 8 as destination node; these nodes will process the optical signature of Heismann for tracking).

Regarding claim 9, Heismann in view of the APA and Rajagopal discloses:

The method of claim 8, wherein the step of constructing said third list comprises the step of identifying optical nodes that are provisioned to process said optical signature (Rajagopal, e.g., if the nodes between TMN 3 and TMN 6 of col. 8, l. 28-39 become part of a new path, they will process the optical signature of Heismann for tracking).

Regarding claim 10, Heismann in view of the APA and Rajagopal discloses:

The method of claim 8, wherein the step of constructing said fourth list comprises the step of identifying optical nodes that are provisioned to process said optical signature (Rajagopal, e.g., if the nodes between TMN 3 and TMN 8 of col. 8, l. 28-39 become part of a new path, they will process the optical signature of Heismann for tracking).

Regarding claim 11, Heismann in view of the APA and Rajagopal does not expressly disclose:

The method of claim 7 wherein the step of displaying said reference list of optical nodes comprises the step of displaying said third list and said fourth list.

However, displaying such information is an obvious technique so that a practitioner can follow the progression of the method.

Regarding claim 12, Heismann in view of the APA and Rajagopal does not expressly disclose:

A method of claim 1 wherein said third procedure comprises the step of:

displaying a list of optical nodes which detect said optical signature in response to said enquiry messages.

However, displaying such information is an obvious technique so that a practitioner can follow the progression of the method.

Regarding claim 14, Heismann in view of the APA and Rajagopal discloses:

The method of claim 1 wherein said fourth procedure (block 502 in Fig. 5B includes the procedure of identifying individual paths as in col. 7, l. 36-39 of Rajagopal with the optical signal tracking information in p. 3.48, first paragraph, of Heismann) comprises the steps of:

constructing a specific list of optical nodes which detect said optical signature (Heismann, optical signal tracking information in p. 3.48, first paragraph) in response to a process of neighbour discovery (Rajagopal, the procedure of identifying individual paths as in col. 7, l. 36-39 includes constructing specific lists of optical nodes; this procedure may use the types of methods used in connection with block 200 of Fig. 2, and col. 4, l. 40-42 employs neighbor discovery).

Heismann in view of the APA and Rajagopal does not expressly disclose:

displaying a list of nodes traversed by the light path.

However, displaying such information is an obvious technique so that a practitioner can follow the progression of the method.

Regarding claim 15, Heismann in view of the APA and Rajagopal discloses:

The method of claim 14 wherein the step of constructing said specific list of optical nodes comprises the step of:

sending a message to each neighbouring optical node (Rajagopal, col. 4, l. 40-42), said message requesting:

confirmation of detecting said optical signature (echo-back of col. 4, l. 40-42 of Rajagopal with the optical signal tracking information in p. 3.48, first paragraph, of Heismann); and

relaying said message to another optical node (each TMN sends out its own discover paths echo-back message to all other TMNs in col. 4, l. 40-42).

Heismann in view of the APA and Rajagopal does not expressly disclose:

sending a message to each neighbouring optical node ***discovered via topology information maintained by the Control Network***.

Regarding the nodes discovered via CN topology information, it is obvious for a discovery procedure to discover the nodes via topology information maintained by a Control Network since it conventionally identifies nodes in a network, including neighboring nodes.

Regarding claims 16-18, 21-26, and 28-29, claims 16, 17, 18, 21, 22, 23, 24, 25, 26, 28, and 29 are system claims that introduce limitations that correspond to the limitations introduced by method claims 1, 2, 3, 6, 7, 8, 9, 10, 12, 14, and 15, respectively. Therefore, the recited steps in method claims 1-3, 6-10, 12, and 14-15 read on the corresponding means in system claims 16-18, 21-26, and 28-29.

6. **Claims 4-5, 13, 19-20, and 27** are rejected under 35 U.S.C. 103(a) as being unpatentable over Heismann in view of the APA and Rajagopal as applied to the claims above, and further in view of Sengupta et al. ("From network design to dynamic provisioning and restoration in optical cross-connect mesh networks: an architectural and algorithmic overview", hereinafter "Sengupta").

Regarding claims 4-5, Heismann in view of the APA and Rajagopal does not expressly disclose:

(claim 4) The method of claim 3, wherein the step of constructing said first list comprises the step of identifying all optical nodes pre-provisioned to be on the light path that have detected and processed said optical signature.

(claim 5) The method of claim 3 wherein the step of constructing said second list comprises the step of identifying all optical nodes pre-provisioned to be on the light path that have detected and processed said optical signature.

However, the practice of pre-provisioning lightpaths and nodes on these lightpaths through a signature that uniquely identifies the light path is known in the art, as shown by Sengupta (Fig. 3, section "Lightpath Establishment" on p. 50-51, bridging paragraph, notice the label request in Fig. 3 and the "path identifier" on p. 51, col. 1, 1st full paragraph). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to include such a practice in the method of Heismann in view of the APA and Rajagopal. One of ordinary skill in the art would have been motivated to do this to prepare these nodes for the establishment of the light path through them (Sengupta, p. 49, col. 2, section "Lightpath establishment").

Regarding claim 13, Heismann in view of the APA, Rajagopal, and Sengupta does not expressly disclose:

The method of claim 12 wherein the step of flooding comprises the steps of:

retrieving the list of all optical nodes in said plurality of optical nodes from the Control Network; and

sending messages to said all the optical nodes; and

requesting confirmation of detecting said optical signature.

Regarding the retrieving limitation, consider the known practice of performing global discovery to retrieve a list of all optical nodes in an optical communication network. One of ordinary skill in the art would have been motivated to do this so that one can know which network elements (e.g., nodes) exist in

the network. It is also obvious to receive such a list from a Control Network since it conventionally includes a list of all nodes in a network.

Regarding the sending messages limitation and the requesting limitation, Sengupta teaches sending messages to some optical nodes enquiring whether they have processed a signature corresponding to a light path (Sengupta, Fig. 3, section "Lightpath Establishment" on p. 50-51, bridging paragraph, notice the label request in Fig. 3 and the "path identifier" on p. 51, col. 1, 1st full paragraph) and requesting some nodes that have detected the signature to reply back with an affirmative acknowledgement (Sengupta, label response in Fig. 3). As a global discovery procedure generally applies to all nodes in a network, it follows that it would be obvious to apply Sengupta's teachings to all the nodes in the network.

Regarding claims 19-20 and 27, claims 19, 20, and 27 are system claims that introduce limitations that correspond to the limitations introduced by method claims 4, 5, and 13, respectively. Therefore, the recited steps in method claims 4-5 and 13 read on the corresponding means in system claims 19-20 and 27.

Response to Arguments

7. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection. Notice the incorporation of the newly applied references to the APA and Heismann.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ghani ("Lambda-labeling: A framework for IP-over-WDM using MPLS") is cited to show the techniques of "lambda-labeling" and "lambda-switching" (e.g., p. 48+).

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date

of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Kim whose telephone number is 571-272-3033. The examiner can normally be reached on Mon.-Fri. 9 AM to 5 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth N. Vanderpuye can be reached on 571-272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DSK

JASON CHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600